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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-114540

(43)Date of publication of application : 07.05.1993

(51)Int.Cl.

H01L 21/027
H01L 21/68

(21)Application number : 03-274394

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(22)Date of filing : 23.10.1991

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(54) RETICLE CONVEYING EQUIPMENT

(57)Abstract:

PURPOSE: To prevent dust from adhering to a reticle during carriage, regarding the structure of an equipment for conveying the reticle in a demagnification aligner.

CONSTITUTION: A reticle retainer 11 is provided with a first arm 12 and a second arm 13 which have slits 14 and fixed in a fork type. The first arm 11 has air jetting ports 15 on both sides of the slit 14 of a surface facing the second arm 13. The second arm 13 has air sucking ports 16 on both sides of the slit 14 of a surface facing the first arm 12. Pressurized air is made to flow from the jetting ports 15 toward the sucking ports 16, and air flow layers are formed on both sides of the reticle 1 retained by the slit part 14.

図1 平面図

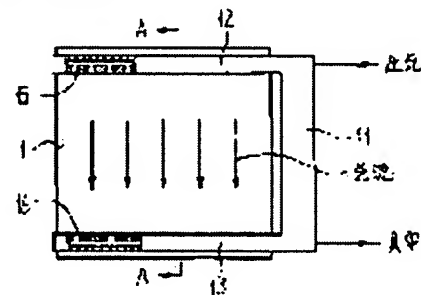


図2 側面図

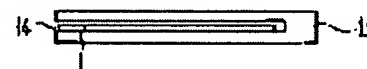


図3 A-A断面図



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the structure of equipment of conveying the reticle equipped with the mask pattern within the contraction projection aligner used for a reticle transport device, especially semiconductor device manufacture, etc.

[0002] If it exposes using the reticle to which the foreign matter adhered, a defect will be produced to an imprint pattern in many cases. Usually, since a lot of wafers are exposed by the reticle of one sheet, when the foreign matter has adhered to the reticle, there is a possibility of making a lot of defectives. Therefore, the reticle is expected for there to be no foreign matter adhesion at the time of exposure.

[0003]

[Description of the Prior Art] The conventional example of the reticle transport device in a contraction projection aligner is explained referring to drawing 2. Drawing 2 is the explanatory view of the conventional example, and is (a). The perspective view and (b) which show the important section of a contraction projection aligner. It is the perspective view showing a reticle holder.

[0004] (a) drawing -- setting -- 1 -- a reticle and 2 -- for a reticle stage and 5, as for an X-Y stage and 7, a contraction projection lens and 6 are [a reticle case and 3 / a foreign matter tester and 4 / a wafer and 21] the reticle holders of a reticle transport device. Two or more reticles 1 are separately stored by the reticle case 2, and these are carried in the rack (illustration is omitted). The important section of this contraction projection aligner is installed in the precision air-conditioning chamber (illustration is omitted) to which the air defecated highly is supplied.

[0005] The reticle holder 21 is a hand of a reticle transport device which consists of a carrier robot. This is (b). As shown in a Fig., it has two arms 22 in the shape of a fork, and the adsorption hole 23 is carrying out opening to the top face of each arm 22. This adsorption hole 23 is open for free passage in the source of a vacuum, lays a reticle 1 in the top face of an arm 22, and carries out vacuum adsorption.

[0006] The reticle transport device which has such a reticle holder 21 takes out the desired reticle 1 from the reticle case 2 first, and conveys this to the foreign matter tester 3. A check of that the foreign matter has not adhered to this reticle 1 conveys this on a reticle stage 4. Exposure is performed in this condition.

[0007]

[Problem(s) to be Solved by the Invention] As mentioned above, although the air defecated by altitude is supplied in a precision air-conditioning chamber, there is not no dust because of the raising dust from a transport device etc. Therefore, when a reticle was conveyed by such conventional reticle transport device, there was a problem that a foreign matter might adhere to a reticle on the way of conveyance from a foreign matter tester to a reticle stage.

[0008] This invention solves such a problem and it aims at offering the reticle transport device in which a foreign matter does not adhere to the reticle under conveyance.

[0009]

[Means for Solving the Problem] According to this invention, this purpose is a reticle transport device to

which the reticle holder 11 holds and conveys a reticle 1. This reticle holder 11 is equipped with the first arm 12 and second arm 13 which have a slit 14 in each in the shape of a fork. This first arm 12 has the exhalation opening 15 on both sides of this slit 14 of the field which counters this second arm 13. This second arm 13 has an inlet 16 on both sides of this slit 14 of the field which counters this first arm 12. It is attained by considering as the reticle transport device characterized by being constituted so that an air-current layer may be formed in both sides of this reticle 1 that passes compressed air towards this inlet 16 from this exhalation opening 15, and is held in this slit 14 section.

[0010]

[Function] According to this invention, since an air-current layer is formed in reticle both sides at the time of reticle conveyance, even if there is dust which goes to a reticle even if, it is drawn in this air-current layer, and is exhausted out of a system from an inlet. Therefore, foreign matter adhesion in a reticle is prevented.

[0011]

[Example] The example of a reticle transport device based on this invention is explained referring to drawing 1. Drawing 1 is the explanatory view of the example of this invention, and is (a). A top view and (b) A side elevation and (c) It is an A-A sectional view. In addition, since, as for this example, only the structures of a reticle holder differ, in this drawing, the conventional example shows only the reticle holder.

[0012] In this drawing, it is the reticle holder with which 1 holds a reticle and 11 holds a reticle 1. The reticle holder 11 is equipped with the first arm 12 and second arm 13 in the shape of a fork. The slit 14 is formed in the first arm 12 and second arm 13 in parallel with each vertical sides of both, and a reticle 1 is held within this slit 14.

[0013] The first arm 12 has two or more exhalation openings 15 on both sides of the slit 14 of the field which counters the second arm 13, respectively, and this exhalation opening 15 is opening it for free passage in sources of compressed air, such as nitrogen, through the hole which runs through the first arm 12. In the pipe line, they are a flow regulator and 0.1 micrometers. It has the line filter of extent. Each exhalation opening 15 serves as a taper hole so that an exhalation may spread.

[0014] The second arm 13 has two or more inlets 16 on both sides of the slit 14 of the field which counters the first arm 12, respectively, and this inlet 16 is opening it for free passage in the source of a vacuum through the hole which runs through the second arm 13. The pipe line is equipped with the flow regulator. Each inlet 16 serves as a long hole.

[0015] the slit 14 section of this reticle holder 11 -- a reticle 1 -- holding -- the first arm 12 side -- pure compressed air, such as nitrogen, -- supplying (for example, per minute 6-8l.) -- if evacuation of the second arm 13 side is carried out, compressed air will flow towards an inlet 16 from the exhalation opening 15, and an air-current layer will be formed in both sides of a reticle 1.

[0016] In addition, although omitted on drawing 1, the reticle 1 contact surface of the slit 14 section of the first arm 12 and the second arm 13 is equipped with the adsorption hole equivalent to the adsorption hole 23 in the conventional reticle holder 21, and vacuum adsorption of the reticle 1 is carried out. Moreover, the conveyance path of a reticle 1 is the same as the case of the above-mentioned conventional equipment.

[0017] Without being limited to the above example, it can deform variously further and this invention can be carried out.

[0018]

[Effect of the Invention] As explained above, according to this invention, by forming an air-current layer in reticle both sides at the time of reticle conveyance, the reticle transport device which can prevent foreign matter adhesion in a reticle can be offered, and it contributes to the improvement in the yield of semiconductor device manufacture etc.

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CLAIMS

[Claim(s)]

[Claim 1] Reticle (1) A reticle holder (11) is the reticle transport device held and conveyed. This reticle holder (11) is equipped with the first arm (12) and second arm (13) which have a slit (14) in each in the shape of a fork. This first arm (12) has exhalation opening (15) on both sides of this slit (14) of the field which counters this second arm (13). This second arm (13) has an inlet (16) on both sides of this slit (14) of the field which counters this first arm (12). This reticle that passes compressed air towards this inlet (16) from this exhalation opening (15), and is held in this slit (14) section (1) Reticle transport device characterized by being constituted so that an air-current layer may be formed in both sides.

[Translation done.]